NON-PUBLIC?: N
ACCESSION #: 9402150202
LICENSEE EVENT REPORT (LER)

FACILITY NAME: St. Lucie Unit 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000335

TITLE: Manual Reactor Trip due to the loss of the 1B Steam
Generator Feedwater Pump Caused By Equipment Failure
EVENT DATE: 01/09/94 LER #: 94-001-00 REPORT DATE: 02/07/94

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Edward Lyons, Shift Technical TELEPHONE: (407) 465-3550
Advisor

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: SJ COMPONENT: FS MANUFACTURER: I204
X SJ 62 A348
REPORTABLE NPRDS: N
N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On January 9, 1994 at 1940 hours with St. Lucie Unit 1 in mode 1 at 100% power, the 1B Steam Generator Feedwater Pump tripped. Subsequently the reactor was manually tripped due to decreasing Steam Generator water levels. Emergency Operating Procedure-01, Standard Post Trip Actions, was performed and Steam Generator water levels were regained using the Auxiliary Feedwater System. Emergency Operating Procedure-02, Reactor Trip Recovery was completed, confirming an uncomplicated reactor trip. The plant was stabilized in Mode 3, Hot Standby.

The reactor was manually tripped by the utility licensed operators in anticipation of an automatic reactor trip due to low Steam Generator water level. The cause of the low Steam Generator water level was the 1B

Steam Generator Feedwater Pump trip. The most likely cause of the 1B Steam Generator Feedwater Pump trip was a spurious signal from the pump protective low flow switch or its associated time delay relay. The purpose of the low flow switch is to protect the pump in the event of a low flow condition.

Corrective Actions for this event: 1) Instrumentation and Control Maintenance replaced the 1B Steam Generator Feedwater Pump low flow switch, 2) Electrical Maintenance replaced the low flow trip time delay relay, 3) Electrical Maintenance performed electrical continuity and ground checks, 4) Electrical and Instrumentation and Control Maintenance groups replaced the wiring between the low flow switch and the time delay relay, 5) System Engineers monitored Steam Generator Feedwater Pump operation prior to and following unit restart and 6) FPL Engineering has performed an autopsy of the low flow switch and the time delay relay and no specific component failure was identified.

END OF ABSTRACT

DESCRIPTION OF THE EVENT

On January 9, 1994 at 1940 hours St. Lucie Unit 1 was in mode 1 at 100% power when annunciators G-19 (FW PP 1B SUCT PRESS LOW/TRIP) and G-48 (COND TO HTRS 1A & 1B FLOW LOW) were received. The utility licensed operators noted rapidly decreasing feed flow to the Steam Generators (EIIS:AB), the 1B Steam Generator Feedwater Pump discharge valve (EIIC:SJ) indicated dual position and the 1B Steam Generator Feed Pump (EIIS:SJ) was not running. With Steam Generator water levels approaching the automatic reactor trip low level setpoint the utility licensed operators manually tripped the plant and carried out Emergency Operating Procedure-01, Standard Post Trip Actions. Steam Generator water levels were regained using the Auxiliary Feedwater System (EIIS:BA). Emergency Operating Procedure-02, Reactor Trip Recovery was completed, confirming an uncomplicated reactor trip. The plant was stabilized in Mode 3, Hot Standby.

CAUSE OF THE EVENT

The reactor was manually tripped by the utility licensed operators in anticipation of an automatic reactor trip due to low Steam Generator water levels. The cause of the low Steam Generator water levels was the 1B Steam Generator Feedwater Pump trip on a low flow signal. Review of plant data recorded prior to and during the 1B Steam Generator Feedwater Pump trip indicated that there was never an actual low flow condition.

This conclusion is based on the following observations. The 1B Steam Generator Feedwater Pump low flow alarm which is associated with the pump low flow trip signal was not received and plant computer data showed that Steam Generator water levels and feed flows were both normal at the instant that the pump tripped. The Sequence Of Events Recorder indicates that the pump trip and the low flow indications were received simultaneously. Therefore, the most likely cause of the pump trip was a spurious signal from the pump protective low flow switch or its associated 10 second time delay relay.

ANALYSIS OF EVENT

This event is reportable under 10CFR 50.73.a.2.iv as "any event or condition that resulted in manual or automatic actuation of any engineered safety feature, including the Reactor Protection System." The utility licensed operators manually tripped the reactor in anticipation of an automatic Reactor Protection System (EIIS:JC) actuation, with both Steam Generator water levels approaching the low level trip setpoint.

The plant response to this event is bounded by the accident analysis of the St. Lucie Unit 1 FUSAR, section 15.2, "Loss of Normal Feedwater Flow." The actual plant response was much more conservative because of the following:
1) Only one Steam Generator Feedwater Pump tripped in this event. In the accident analysis there is a total loss of normal feedwater.
2) The reactor was manually tripped due to decreasing Steam Generator water levels. In the accident analysis, the reactor is assumed to automatically trip on low Steam Generator water level.

ANALYSIS OF EVENT (continued)

All plant safety functions were met and there were no safety system failures. The Auxiliary Feedwater System and the Steam Bypass Control System (EIIS:SB) functioned as required during this event. The plant response during the reactor trip was observed to be normal for the given conditions. Consequently, the health and safety of the public were not affected by this event.

CORRECTIVE ACTIONS

1) Instrumentation and Control Maintenance replaced FIS-09-1B3, the 1B Steam Generator Feedwater Pump flow switch.

2) Electrical Maintenance replaced 62X1, the low flow trip time delay

relay.

3) Electrical Maintenance performed electrical continuity and ground checks on the 1B Steam Generator Feedwater Pump circuit breaker and its control circuitry. No problems were detected.

4) Electrical and Instrumentation and Control Maintenance groups replaced the wiring between the low flow switch and the time delay relay.

5) System Engineering monitored the low flow trip circuitry during the 1B Steam Generator Feedwater Pump runs prior to and following plant restart.

6) FPL Engineering has performed an autopsy of the low flow switch and the time delay relay. No specific component failure was identified.

ADDITIONAL INFORMATION

Potentially Failed Components:

ITT Barton Instrument Low Flow Switch, model #288A

Amerace Corp Agastat Time Delay Relay, model #7012PC003

Previous Similar Events;

There have been no previous reactor trips caused by spurious trips of the Steam Generator Feedwater Pumps at the St. Lucie Nuclear Plant.

ATTACHMENT TO 9402150202 PAGE 1 OF 1

P.O. Box 128, Ft. Pierce, FL 34954-0128

February 7, 1994

FPL

L-94-030
10 CFR 50.73

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 94-001

Date of Event: January 9, 1994
Manual Reactor Trip due to the loss of the
1B Steam Generator Feedwater Pump caused by
Equipment Failure

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/JWH/kw

Attachment

cc: Stewart D. Ebneter, Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #1056-94

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